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Indiana's Water Shortage Plan

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INDIANA'S WATER SHORTAGE PLAN

INDIANA DEPARTMENT OF NATURAL RESOURCES, DIVISION OF WATER

July 23, 2009

National Weather Service Climate Divisions of Indiana (Water Shortage Identification Regions).

Climate Divisions and Recommended Streamflow Gaging Sites for Indiana's Water Shortage Plan with percentage of mean monthly streamflow for August 2010 and November 2010

Climate Division 1 – NW	**August 2010**	**November 2010**
Tippecanoe River near Ora	98% of normal flow	52% of normal flow
Yellow River at Knox	84% of normal flow	59% of normal flow
Kankakee River at Dunns Bridge	94% of normal flow	60% of normal flow
Kankakee River at Shelby	101% of normal flow	56% of normal flow
Climate Division 2 – NC		
Elkhart River at Goshen	107% of normal flow	46% of normal flow
Eel River at North Manchester	61% of normal flow	40% of normal flow
Wabash River at Peru	144% of normal flow	117% of normal flow
Climate Division 3 – NE		
Little River near Huntington	75% of normal flow	31% of normal flow
St. Marys River at Decatur	60% of normal flow	not available
Maumee River at New Haven	57% of normal flow	37% of normal flow
Climate Division 4 – WC		
Wabash River at Lafayette	126% of normal flow	44% of normal flow
Wildcat Creek near Lafayette	159% of normal flow	42% of normal flow
Sugar Creek at Crawfordsville	85% of normal flow	42% of normal flow
Wabash River at Terre Haute	116% of normal flow	60% of normal flow
Climate Division 5 – C		
Mississinewa River at Marion	159% of normal flow	42% of normal flow
Fall Creek near Fortville	123% of normal flow	66% of normal flow
White River at Noblesville	91% of normal flow	53% of normal flow
Big Blue River at Shelbyville	73% of normal flow	43% of normal flow
White River near Centerton	75% of normal flow	43% of normal flow
Flatrock River at St. Paul	42% of normal flow	24% of normal flow
Sugar Creek near Edinburgh	85% of normal flow	10% of normal flow
Climate Division 6 – EC		
Whitewater River near Alpine	82% of normal flow	44% of normal flow
Climate Division 7 – SW		
Wabash River at Riverton	117% of normal flow	55% of normal flow
East Fork White River at Shoals	61% of normal flow	51% of normal flow
White River at Petersburg	71% of normal flow	35% of normal flow
Wabash River at Mt. Carmel	93% of normal flow	33% of normal flow
Climate Division 8 – SC		
East Fork White River at Seymour	71% of normal flow	28% of normal flow
Climate Division 9 – SE		
Muscatatuck River near Deputy	23% of normal flow	49% of normal flow

Indiana's Water Shortage Plan Drought Triggers

Indiana's Water Shortage Plan was recently updated (2009) and established criteria to identify drought conditions and associated "Water Shortage Stages" designated as Normal, Watch, Warning, and Emergency. The three drought triggers are the 1-month Standardized Precipitation Index (SPI), U.S. Drought Monitor (USDM), and Percentage of Average Streamflow (28 streamflow gaging sites). The Water Shortage Stage is defined as Normal if no more than one indicator is outside of the normal range. The Water Shortage Identification Regions are the nine climate divisions determined by the National Weather Service. The drought triggers were tested during the dry conditions that occurred in Indiana late summer-fall of 2010. In general, the 1-month SPI and the USDM reflected fairly accurate conditions of surface dryness with groundwater-fed streamflow temporally lagging behind these indicators.

Jerry Unterreiner, Indiana Department of Natural Resources, Division of Water

Criteria to Identify Drought Conditions and Water Shortage Stages

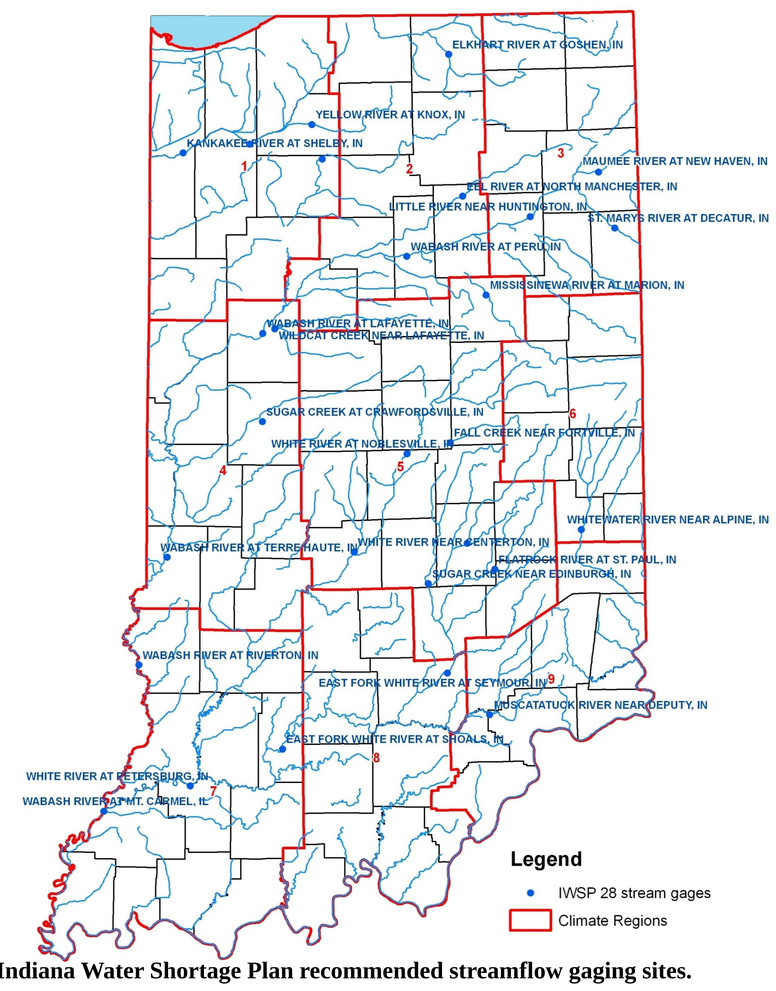
Water Shortage Stages	1-Month Standardized Precipitation Index[1]	U.S. Drought Monitor[2] (Conditions)	Streamflow As Percentile Of Normal[3] (Average Streamflow)
Normal (White and Yellow)	+0.99 to -0.99	None to D0	Greater than or equal to 25
Watch (Tan)	-1.00 to -1.49	D1	10 to 24
Warning (Orange)	-1.50 to -1.99	D2	6 to 9
Emergency (Red)	-2.00 or less	D3 to D4	5 or less

[1]For the purposes of Indiana's Water Shortage Plan, a monthly Standardized Precipitation Index (SPI) value is computed for each of the State's nine climatic regions.

[2]The data cutoff for U.S. Drought Monitor maps is Tuesday at 7 a.m. Eastern Standard Time. The maps, which are based on analysis of the data, are released each Thursday at 8:30 a.m. Eastern Time. The map released the first Thursday of the month will be used as a drought indicator for the previous month's water shortage stages.

[3]Streamflow at the 25th percentile means that streamflow is only 25% of the historical average streamflow for that particular month. Lower percentiles correspond to increasingly lower streamflow and drought conditions.

The 70 provisional real-time Midwestern Regional Climate Center precipitation stations for May 2008 (typical initial reporting stations).

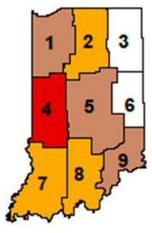


Indiana Water Shortage Plan recommended streamflow gaging sites.

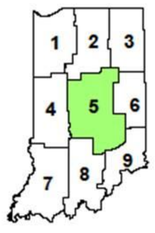
SPI Summary

SPI values are calculated using the most current precipitation data available, including that considered "provisional" or "preliminary" by the Midwest Regional Climate Center.

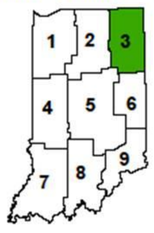
1-month SPI Index - Aug. 2010



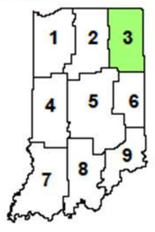
3-month SPI Index - Aug. 2010



6-month SPI Index - Aug. 2010



12-month SPI Index - Aug. 2010



Key

- +2.00 and above (extremely wet)
- +1.50 to +1.99 (very wet)
- +1.00 to +1.49 (moderately wet)
- -0.99 to +0.99 (near normal)
- -1.00 to -1.49 (moderately dry)
- -1.50 to -1.99 (severely dry)
- -2.00 and less (extremely dry)

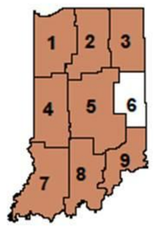
SPI Values - Aug. 2010

Climatic Division	1-month	3-month	6-month	12-month
1	-1.05	0.95	0.79	0.51
2	-1.56	-0.20	0.08	-0.45
3	-0.16	0.75	1.51	1.00
4	-2.01	0.86	0.59	0.41
5	-1.31	1.18	0.71	0.36
6	-0.78	0.97	0.78	0.29
7	-1.63	-0.39	-0.29	0.23
8	-1.85	-0.36	-0.29	0.03
9	-1.40	0.66	0.07	0.36

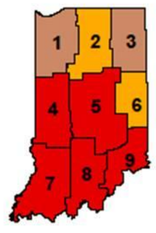
SPI Summary

SPI values are calculated using the most current precipitation data available, including that considered "provisional" or "preliminary" by the Midwest Regional Climate Center.

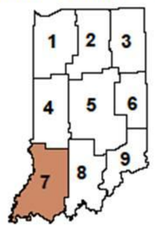
1-month SPI Index - Oct. 2010



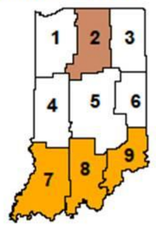
3-month SPI Index - Oct. 2010



6-month SPI Index - Oct. 2010



12-month SPI Index - Oct. 2010



Key

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- -0.99 to +0.99 (near normal)
- -1.00 to -1.49 (moderately dry)
- -1.50 to -1.99 (severely dry)
- -2.00 and less (extremely dry)

SPI Values - Oct. 2010

Climatic Division	1-month	3-month	6-month	12-month
1	-1.36	-1.49	0.24	-0.41
2	-1.03	-1.68	-0.16	-1.03
3	-1.11	-1.33	0.47	0.24
4	-1.41	-2.39	0.00	-0.52
5	-1.01	-2.31	0.12	-0.77
6	-0.82	-1.85	0.22	-0.79
7	-1.15	-2.71	-1.09	-1.71
8	-1.04	-2.71	-0.94	-1.97
9	-1.05	-2.04	-0.32	-1.54

SPI Summary

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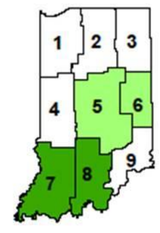
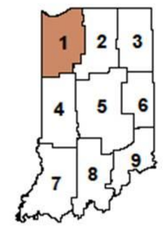
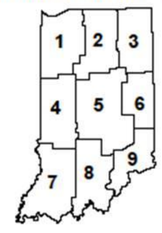
1-month SPI Index - Nov. 2010



3-month SPI Index - Nov. 2010



6-month SPI Index - Nov. 2010



12-month SPI Index - Nov. 2010

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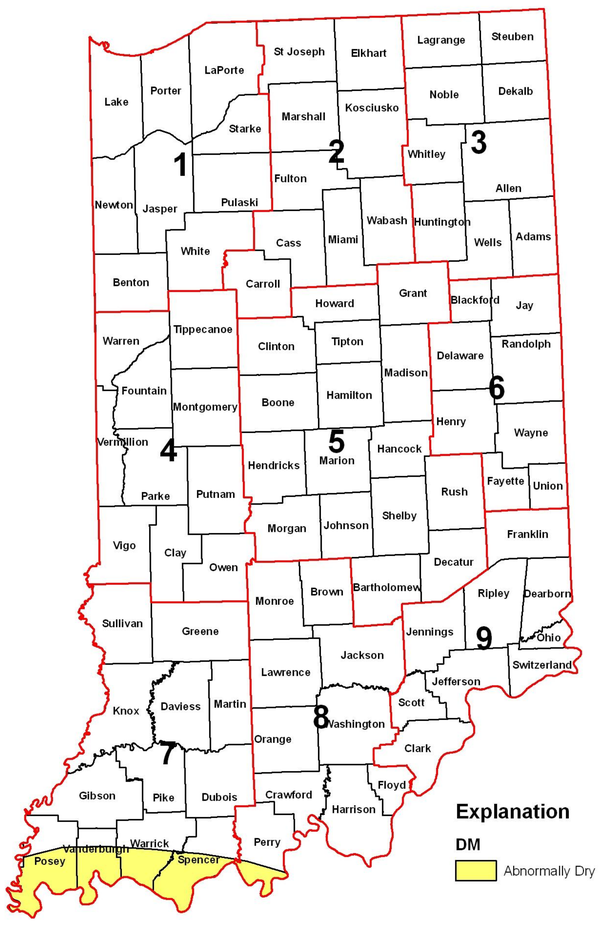
- -1.50 to -1.99 (severely dry)
- -2.00 and less (extremely dry)

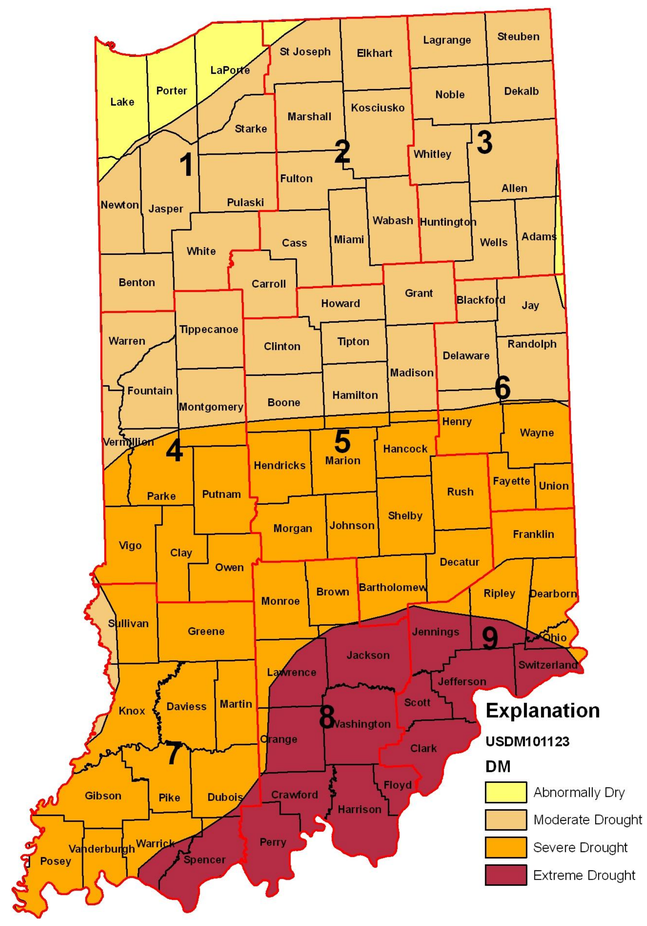
SPI Values - Nov. 2010

Climatic Division	1-month	3-month	6-month	12-month
1	-0.05	-1.09	-0.14	-0.29
2	0.56	-0.64	-0.62	-0.69
3	0.74	-0.77	0.04	0.67
4	0.84	-0.81	0.15	-0.18
5	1.18	-0.64	0.42	-0.10
6	1.04	-0.65	0.27	-0.13
7	1.56	-0.28	-0.49	-0.79
8	1.50	-0.30	-0.49	-0.97
9	0.81	-0.70	-0.08	-0.88

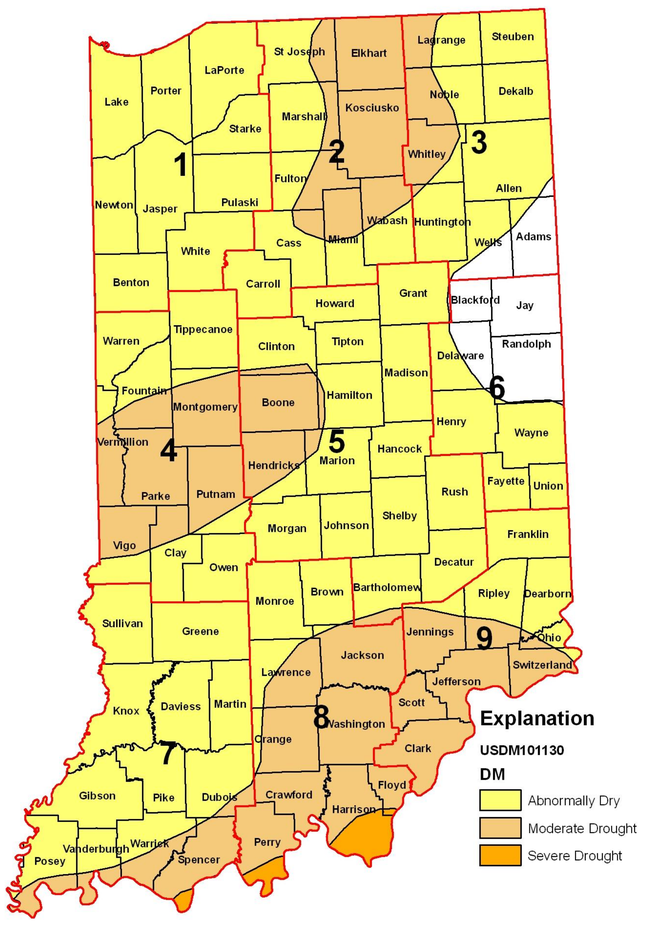
The U.S. Drought Monitor for the period ending August 3, 2010

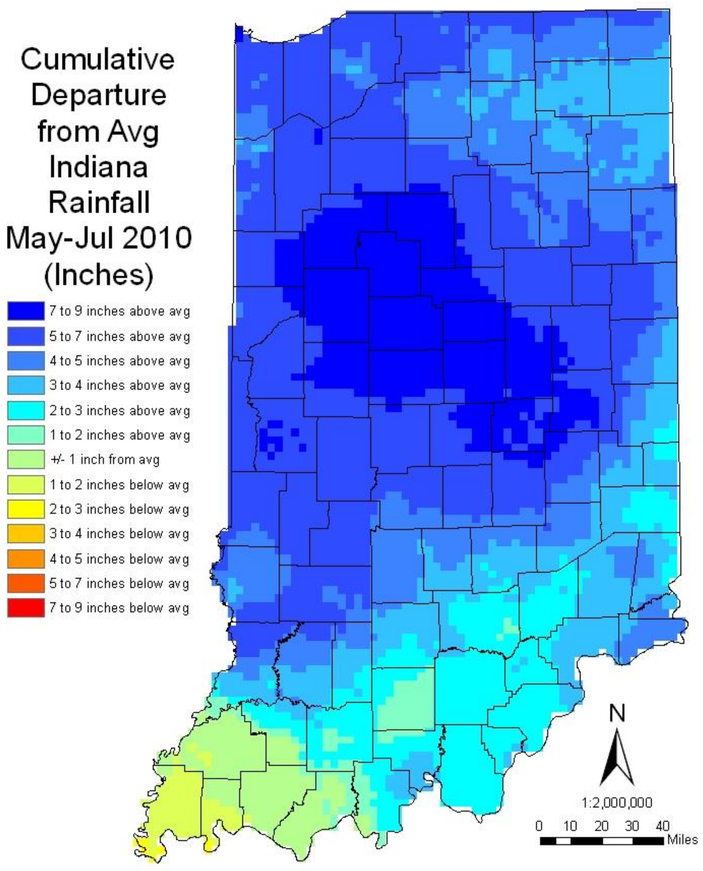


The U.S. Drought Monitor for the period ending November 23, 2010

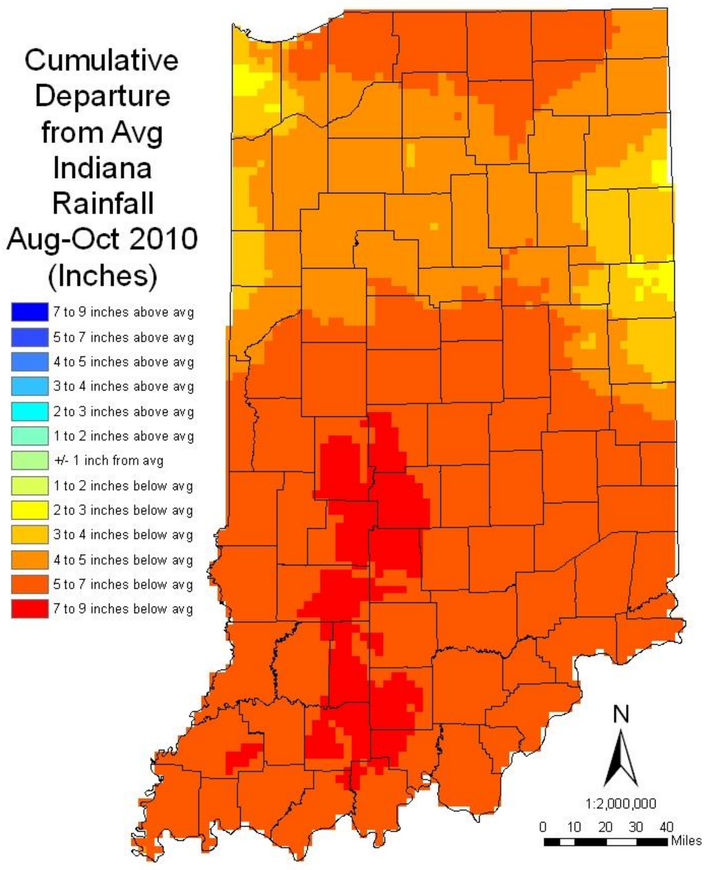


The U.S. Drought Monitor for the period ending November 30, 2010





Calculations using data from the PRISM Climate Group, Oregon State University.
Monthly average data is from 30 year avg of 1971-2000.
August through October 2010 data is preliminary.
http://www.prismclimate.org



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